

**Montana Board of Oil and Gas Conservation  
Environmental Assessment**

**Operator:** Whiting Oil and Gas Corporation  
**Well Name/Number:** Palmer 24-21-H  
**Location:** SE SW Section 21 T26N R57E  
**County:** Richland, **MT;** **Field (or Wildcat)** W/C (Bakken Horizontal)

**Air Quality**

(possible concerns)

Long drilling time: No, 30 to 40 days drilling time.

Unusually deep drilling (high horsepower rig): No, triple derrick drilling rig to drill a single lateral Bakken Formation well test to 20,920'MD/10,454'TVD.

Possible H2S gas production: H2S gas production possibility is slight (Mississippian Formations).

In/near Class I air quality area: No Class I air quality area in the area of review.

Air quality permit for flaring/venting (if productive): Yes, DEQ air quality permit required under rule 75-2-211.

Mitigation:

- ☒ Air quality permit (AQB review)
- ☐ Gas plants/pipelines available for sour gas
- ☐ Special equipment/procedures requirements
- ☐ Other: \_\_\_\_\_

Comments: No special concerns – using triple derrick drilling rig to drill a single lateral Bakken Formation well test to 20,920'MD/10,454'TVD. If existing pipeline for H2S gas in the area, gas can be gathered or if no gathering system nearby, H2S gas can be flared under Board Rule 36.22.1220.

**Water Quality**

(possible concerns)

Salt/oil based mud: Yes, oil based invert drilling fluids will be used on the mainhole. The horizontal lateral will be drilled with brine water. The surface hole will be drilled with freshwater and freshwater drilling fluids.

High water table: No, no high water table anticipated in the area of review.

Surface drainage leads to live water: No live water nearby, closest drainages are an unnamed ephemeral drainage to South Fork Cherry Creek, about 1/4 of a mile to the west and unnamed ephemeral tributary drainage to Otis Creek, about 1/2 of a mile to the east from this location.

Water well contamination: None, closest water wells are about 7/8 of a mile to the northeast and southeast from this location. All other water wells are 1 mile and further from this location in any direction. Depth of these domestic and stock water wells range from 30' to 280'. Surface casing hole will be drilled with freshwater and freshwater drilling fluids. Surface casing will be run and cemented to surface from 2000'.

Porous/permeable soils: No, sandy clay soils.

Class I stream drainage: No class I stream drainages in this area.

Mitigation:

- ☒ Lined reserve pit
- ☒ Adequate surface casing
- ☐ Berms/dykes, re-routed drainage
- ☐ Closed mud system

☐ Off-site disposal of solids/liquids (in approved facility)

☐ Other: \_\_\_\_\_

Comments: 2000' of surface casing cemented to surface adequate to protect freshwater zones and to cover the base of the Fox Hills Formation.

### Soils/Vegetation/Land Use

(possible concerns)

Stream crossings: No, stream crossings anticipated, crossing ephemeral drainages only.

High erosion potential: No, small cut, up to 5.3' and small fill, up to 4.8', required.

Loss of soil productivity: None, location to be restored after drilling well, if well is nonproductive. If productive unused portion of drillsite will be reclaimed.

Unusually large wellsite: Yes, very large wellsite 425'X510'. This location size is required to accommodate 4 horizontal wells: Palmer 24-21-4H, Palmer 24-21-3H, Palmer 24-21-2H and Palmer 21-24-1H

Damage to improvements: No surface use is a cultivated land.

Conflict with existing land use/values: Slight

Mitigation

☐ Avoid improvements (topographic tolerance)

☐ Exception location requested

☒ Stockpile topsoil

☐ Stream Crossing Permit (other agency review)

☒ Reclaim unused part of wellsite if productive

☐ Special construction methods to enhance reclamation

☐ Other \_\_\_\_\_

Comments: Access to location will be over existing State Highway #16 and existing county roads, #340 and #341. A short access of 443' will be built off county road 341 into this location. Oil based invert drilling fluids will be recycled. Completion fluids will be hauled to a Class II Disposal. Drilling cuttings and mud solids will be fly ashed in the lined pit and buried with subsoil cover. No special concerns.

### Health Hazards/Noise

(possible concerns)

Proximity to public facilities/residences: Nearest residences are about 1/2 of a mile to the south, about 1 1/2 miles to the southwest and about 1 5/8 of a mile to the north from the location. The town of Culbertson, Montana is about 13 miles to the northwest and the town of Sidney, Montana is about 20.5 miles to the southeast from this location.

Possibility of H2S: H2S potential is slight (Mississippian Formations).

Size of rig/length of drilling time: Triple drilling rig/short 30 to 40 days drilling time.

Mitigation:

☒ Proper BOP equipment

☐ Topographic sound barriers

☐ H2S contingency and/or evacuation plan

☐ Special equipment/procedures requirements

☐ Other: \_\_\_\_\_

Comments: Adequate surface casing and operational BOP should mitigate any problems. No concerns.

### Wildlife/recreation

(possible concerns)

Proximity to sensitive wildlife areas (DFWP identified): None in the area of review.

Proximity to recreation sites: None in the area of review.

Creation of new access to wildlife habitat: No, surface use is cultivated land.

Conflict with game range/refuge management: No

Threatened or endangered Species: Species identified as threatened or endangered are the Pallid Sturgeon, Interior Lease Tern, Whooping Crane and Piping Plover.

Candidate species are the Greater Sage Grouse and the Sprague's Pipit. MTFWP Natural Heritage Tracker website lists one (1) species of concern: the Whooping Crane and three (3) potential species of concern, the Chimney Swift, Eastern- Screech Owl and the Tennessee Warbler.

Mitigation:

☐ Avoidance (topographic tolerance/exception)

☐ Other agency review (DFWP, federal agencies, DSL)

☐ Screening/fencing of pits, drillsite

☐ Other: \_\_\_\_\_

Comments: The surface ownership is private cultivated land. There may be species of concern that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to what he would like done, if a species of concern is discovered at this location. The Board of Oil & Gas has no jurisdiction over private surface lands.

### Historical/Cultural/Paleontological

(possible concerns)

Proximity to known sites None identified.

Mitigation

☐ avoidance (topographic tolerance, location exception)

☐ other agency review (SHPO, DSL, federal agencies)

☐ Other: \_\_\_\_\_

Comments: On private cultivated surface lands. There may be possible historical/cultural/paleontological sites that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to his desires to preserve these sites or not, if they are found during construction of the wellsite. The Board of Oil & Gas has no jurisdiction over private surface lands.

### Social/Economic

(possible concerns)

☐ Substantial effect on tax base

☐ Create demand for new governmental services

☐ Population increase or relocation

Comments: No concerns.

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### Remarks or Special Concerns for this site

A single lateral horizontal Bakken Formation well test to 20,920'MD/10,454'TVD. No concerns.

### Summary: Evaluation of Impacts and Cumulative effects

No significant long term impacts expected, some short term impacts will occur.

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I conclude that the approval of the subject Notice of Intent to Drill (does/**does not**) constitute a major action of state government significantly affecting the quality of the human environment, and (does/**does not**) require the preparation of an environmental impact statement.

Prepared by (BOGC): \s\ Steven Sasaki  
(title:) Chief Field Inspector  
Date: April 6, 2012

Other Persons Contacted:

Montana Bureau of Mines and Geology, GWIC website

(Name and Agency)  
Water wells in Richland County  
(subject discussed)  
April 6, 2012  
(date)

US Fish and Wildlife, Region 6 website  
(Name and Agency)  
ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES  
MONTANA COUNTIES, Richland County  
(subject discussed)

April 6, 2012  
(date)

Montana Natural Heritage Program Website (FWP)  
(Name and Agency)  
Heritage State Rank= S1, S2, S3, T26N R57E  
(subject discussed)

April 6, 2012  
(date)

If location was inspected before permit approval:

Inspection date: \_\_\_\_\_

Inspector: \_\_\_\_\_

Others present during inspection: \_\_\_\_\_